IN THE CLAIMS:

1-15. (Cancelled)

16. (New) A plant for the melting of primary and secondary aluminum, with screening and recovery of slags, comprising:

a. a rotating furnace, an interior wall of the rotating furnace including a spiral element, the rotating furnace further including an exit hole;

b. a pouring channel having a first inclination, the pouring channel within an insulated box, the insulated box having a window formed therein, wherein the pouring channel is disposed adjacent the exit hole and configured such that the pouring channel receives material exiting from the exit hole;

c. a spherical storage basin, the spherical storage basin having a rotating joint configured to receive material from the pouring channel, the rotating joint further having a surface having an inclination substantially the same as the first inclination;

d. selection means for recovering selected materials; and

e. a double canalization means for removing exhaust gases that are produced during the fusion or melting,

f. such that the fusion of aluminum occurs in the absence of a salt bath.

17. (New) The plant of claim 16, wherein the rotating furnace includes:

a. a hollow cylindrical body having a circular cross section, the hollow cylindrical body having a porthole at a first end for introduction of material and further having an inside diameter that varies along a longitudinal axis such that an internal surface of the hollow cylindrical body slants with a negative inclination towards a second end, the second end adjacent the exit hole.

18. (New) The plant of claim 17, wherein the negative inclination is substantially two centimeters per linear meter of a length of the rotating furnace.

19. (New) The plant of claim 17, further comprising:
    a. a first plurality of metallic traverse frames; and
    b. a second plurality of slides disposed above a third plurality of metallic supports,
    c. wherein the rotating furnace is kept in a position by the first plurality, and further comprising at least one opening in the hollow cylindrical body to allow the escape of exhaust gases into a channel of evacuation.

20. (New) The plant of claim 16, wherein the spiral element includes a spire with a cylindrical cross-section and a constant radius, the spiral element made of a refractory material, and wherein the spiral element further comprises, in a lower portion of the hollow cylindrical body, a multiplicity of channels, each channel having a semicircular shape.

21. (New) The plant of claim 16, wherein the spiral element includes a spire with a cross-section that is elliptical or polygonal.

22. (New) The plant of claim 16, wherein the spiral element includes a spire with a cylindrical cross-section and a constant radius, the spiral element made of a refractory material, and wherein the spiral element further comprises, in a lower portion of the hollow cylindrical body, a multiplicity of channels, each channel having a shape that is either circular, elliptical, or polygonal.

23. (New) The plant of claim 16, wherein the selection means includes a rotating selection module, comprising:
    a. three metallic hollow and coaxial cylinders, each open at one end, comprising a first cylinder, a second cylinder disposed within the first cylinder, and a third cylinder disposed within the second cylinder, the second and third cylinders defining holes thereon, the holes having a larger diameter on the third cylinder than on the second cylinder.

24. (New) The plant of claim 16, further comprising first, second, and third channels disposed and configured to receive material that exits from the first, second, and third cylinders, respectively.

25. (New) The plant of claim 16, wherein the selection means is disposed on at least one track, such that the selection means may be conveniently maintained.

26. (New) A method of using the plant of claim 16 to obtain a desired alloy, comprising:

a. if melting secondary aluminum, selecting mixing of a plurality of types of aluminum scraps, a chemical composition of the plurality having a proximity to that of the desired alloy;

b. placing the aluminum scraps through the porthole, and melting the aluminum scraps in the rotating furnace without adding sodium chloride as a cover agent; and

c. rotating the furnace and obtaining mechanical remixing of the aluminum scraps in fusion, and dragging the aluminum scraps because of the structure of the internal walls of the rotating furnace,

d. such that the rotational movement, in combination with the inclination of the furnace, provides that the liquid metal flows toward the exit hole;

e. and such that the liquid metal is protected against oxidation because the liquid metal is lower than a stream of warm gases and because it flows to the storage basin via the channel of pouring;

f. and such that the slag is discharged into a channel equipped with a screw conveyor, the screw conveyor pushing the slag to an extremity of the selection means;

g. and such that the slag is sorted according to dimension and weight, in inert and ferrous material, in aluminum oxides and dusts, and is introduced, automatically, in the respective channels, equipped with a screw conveyor, and flows into a plurality of storage containers;

h. and such that the recovered aluminum oxide is recycled to integrate a feeding charge of fusion.

27. (New) The method of claim 26, further comprising carrying the warm gases that originate from the melting furnace, at a maximum temperature of 300oC, through a pipeline in an underground pit.

28. (New) The method of claim 27, wherein the gases escape from the melting furnace due to a concomitant effect of the kinetic energy due to their heat, of the expansion of the gases upon reaching the pit, of a loss of pressure produced by a chimney and of a dragging produced by an air flow, having a high speed, that escapes from an extremity of a pipeline.

29. (New) The method of claim 28, further comprising carrying by extractors the exhaust gases that escape from the selection means, from the recovery of the slag and from the store basin, and having a low temperature, to the pipeline and further to an underground pipeline to the chimney.

30. (New) The method of claim 29, further comprising passing the gas through the pipeline using at least in part a control valve.